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Bibliography.

(19) [Country of Issue] Japan Patent Office (JP)
(12) [Official Gazette Type] Utility model registration official report (Y2)
(11) [Registration number] No. 2528621.
(24) [Registration day] December 2, Heisei 8 (1996).
(45) [Date of issue] March 12, Heisei 9 (1997).
(54) [The name of a design] The heating cooling system of a hydrogen storing metal alloy.
(51) [International Patent Classification (6th Edition)]

F25B 17/12

[FI]

F25B 17/12 N
P

[The number of claims] 5.
[Number of Pages] 6.
(21) [Filing Number] An application-for-a-utility-model-patent common 2-94130.
(22) [Filing Date] September 8, Heisei 2 (1990).
(65) [Publication No.] JP,4-53163,U.
(43) [Date of Publication] May 7, Heisei 4 (1992).
(73) [Utility model right person]
[Identification Number] 999999999.
[Name] Seta Research Institute, Inc.
[Address] 19-21, Misawa-cho, Ibaraki-shi, Osaka.
(72) [Designer]
[Name] Kawamura Taizo.
[Address] 19-21, Misawa-cho, Ibaraki-shi, Osaka.
(74) [Attorney]
[Patent Attorney]
[Name] ** Yoshiyuki.
[Judge] Uehara **.
(56) [Bibliography]
[References] Provisional publication of a patent Showa 63-161368 (JP, A)
[References] Provisional publication of a patent Showa 60-89650 (JP, A)
[References] Provisional publication of a patent Common [3-236563 (JP, A)]

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CLAIMS

(57) [Utility model registration claim]
[Claim 1] The 1st container (1-1) and the 2nd container (1-2) with which the hydrogen storing metal alloy (3) from which a balanced hydrogen pressure property differs, and (3) were included in the interior, respectively, and the above 1st and the 2nd container (1-1) (1-2). The hydrogen storing metal alloy (3) which it consisted of a pipe (16) to connect, and the container (1-1) of a side with a balanced hydrogen pressure property low at least was equipped with the coil (2) by which the coil was carried out to

the insulator column (1) and this insulator column (1), and which can be energized, and was included in the interior of the aforementioned insulator column (1) is the heating cooling system of the hydrogen storing metal alloy which generates heat by the electromagnetic induction by the energization to the
[Claim 2] It is the heating cooling system of the hydrogen storing metal alloy which is the layered product to which the aforementioned hydrogen storing metal alloy (3) carried out the laminating of a base material (4) and (14) in the claim 1.
[Claim 3] It is the heating cooling system of the hydrogen storing metal alloy by which the aforementioned coil (2) is laid under the outer wall section of the aforementioned insulator column (1) in a claim 1, and the coil is carried out.
[Claim 4] The heating cooling system of the hydrogen storing metal alloy from which the aforementioned insulator column (1) serves as a container which has a top plate (1-4) and a bottom plate (1-5) in the claim 1.
[Claim 5] The heating cooling system of the hydrogen storing metal alloy in which the electromagnetic wave disclosure prevention board (5) to the aforementioned coil (2) is arranged by the insulator column (1) of the aforementioned container in the claim 1.

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DETAILED DESCRIPTION

[Detailed explanation of a design]
(Field of the Invention)
This design is related with the thing which it depends [thing] especially on electromagnetic-induction heating, and makes the hydrogen storing metal alloy itself generate heat about the heating cooling system of the hydrogen storing metal alloy which connected the 1st container (1-1) with which the hydrogen storing metal alloy (3) from which a balanced hydrogen pressure property differs, and (3) were included in the interior, respectively, and the 2nd container (1-2) with the pipe (16).
(Prior art)
In case it has the endothermic effect in case a hydrogen storing metal alloy dissociates the hydrogen which is carrying out occlusion, and occlusion of the hydrogen is carried out, it is well-known that there is the exoergic effect. Therefore, in the case of the dissociation occlusion of hydrogen, heating cooling is needed.
although the method using the electric heater besides the heat pipe using heat sources, such as solar heat and waste heat of works, etc. is devised with the means of heating about heating among heating cooling -- the any -- although -- it was the method of making heat getting across to the whole alloy by heat conduction of a hydrogen storing metal alloy
since [however,] the thermal conductivity of a hydrogen storing metal alloy is very bad compared with copper, aluminum, iron, etc., heat is quick by the above-mentioned method and it is not transmitted -- heating -- slowly -- **** -- discharge of hydrogen was slow spontaneously Although the method of preparing a heat conductive treadway, and increasing a touch area with a hydrogen storing metal alloy, or putting in a foam metal as the solution method, and raising the thermal conductivity to a hydrogen storing metal alloy was devised variously, it was not what comes out of the region of a device where all raise thermal conductivity.
For hydrogen desorption, the elevated temperature of 300-degree Centigrade to 450 degrees is required for especially the large magnesium system hydrogen storing metal alloy of hydrogen storage capacity. By the method by the heat pipe, it was difficult to obtain a hot heat source, and when it was an electric heater, there was fear of an open circuit. For this reason, it had also become the hindrance of use expansion of the large magnesium system hydrogen storing metal alloy of hydrogen storage capacity.
the hydrogen storing metal alloy was usually carrying out the configuration of a block, and since the surface area was small, this also made discharge occlusion of hydrogen late, and since heat transfer area was small, it had become the factor movement of heat comes to be alike of a factor slowly
(Technical problem which a design tends to solve)
Then, this design improves the heating method of the hydrogen storing metal alloy for which it depends on heat conduction in this way, gives heat energy speedily to the hydrogen storing metal alloy which is carrying out occlusion of the hydrogen efficiently, makes the hydrogen by which occlusion is carried out emit quickly, and aims at offering the heating cooling system of the hydrogen storing metal alloy for it being quick and performing endothermic reaction of a hydrogen storing metal alloy efficiently.
(The means for solving a technical problem)
In order to attain such a purpose, the design of a claim 1 The 1st container (1-1) and the 2nd container (1-2) with which the hydrogen storing metal alloy (3) from which a balanced hydrogen pressure property differs, and (3) were included in the interior, respectively, It consists of a pipe (16) which connects the above 1st and the 2nd container (1-1) (1-2), a balanced hydrogen pressure property at least the container by the side of a low (1-1) The hydrogen storing metal alloy (3) which was equipped with the coil (2) by which the coil was carried out to the insulator column (1) and this insulator column (1), and which can be energized, and was included in the interior of the aforementioned insulator column (1) generates heat by the electromagnetic induction by the energization to the aforementioned coil (2).
Moreover, a claim 2 is the layered product to which the aforementioned hydrogen storing metal alloy (3) carried out the laminating of a base material (4) and (14) in a claim 1.
Moreover, in the claim 1, the aforementioned coil (2) is laid under the outer wall section of the aforementioned insulator column

(1), and the coil of the claim 3 is carried out.
Moreover, the claim 4 serves as a container with which the aforementioned insulator column (1) has a top plate (1-4) and a bottom plate (1-5) in the claim 1.
Moreover, the electromagnetic wave disclosure prevention board [on a claim 1 and as opposed to / in a claim 5 / the aforementioned coil (2) to the insulator column (1) of the aforementioned container] (5) is arranged.
(Operation)
If current is passed in a coil, the hydrogen storing metal alloy itself which is carrying out occlusion of the hydrogen by electromagnetic-induction heating will generate heat, and hydrogen will be emitted quickly.
Moreover, if a hydrogen storing metal alloy is made into the layered product of a base material, a large surface area can be taken and the discharge occlusion of hydrogen gas will become quick.
(Example)
The example of this design is explained referring to a drawing. A view 1 is drawing showing the heating cooling system of the hydrogen storing metal alloy of this design.
In a view 1, it connects with the pipe (16) which has a switch (15), and the 1st container (1-1) and the 2nd container (1-2) constitute the system.
First, the structure of each container (1-1) (1-2) and an operation are explained, and the structure of a system and the operation which subsequently connect each container (1-1) (1-2) are explained.
Each container (1-1) (1-2) is constituted considering the laminating filler (3) which consists of a hydrogen storing metal alloy incorporated in the insulator column (1) which line of magnetic force passes, and the coil (2) by which the coil was carried out to the insulator column (1), and which can be energized and an insulator column (1) as a main portion. An insulator column (1) is a container which has a top plate and a bottom plate, a hydrogen input (12) is connected to a top plate, and the hydrogen-desorption mouth (13) is connected to the bottom plate. The laminating filler (3) incorporated in the container is formed by hydrogen storing metal alloy which generates heat by electromagnetic induction, carries out the laminating of the base material and plate (14) which were processed into the wave by turns, and while a surface area is large and a gas or a liquid diffuses, it is constituted possible [passage].
Especially the container (1-1) (1-2) mentioned above functions effectively, when making the hydrogen in which occlusion was carried out to the hydrogen storing metal alloy by heating emit. That is, if it energizes in a coil (2), the whole hydrogen storing metal alloy which became a laminating filler (3) by electromagnetic induction will be heated. Then, the whole hydrogen storing metal alloy hydrogen [from] is emitted, and from a laminating filler (3), it becomes in the style of homogeneity, and is emitted.
Below, the structure of the system of a view 1 and an operation are explained. The hydrogen storing metal alloy laminating filler (3) with which a balanced hydrogen pressure property differs from two containers (1-1) in (1-2), and (3) are incorporated, between the oscillation insulator column (1) of a container (1-1) and the oscillation insulator columns (1) of a container (1-2) is connected with a pipe (16), a switch (15) is formed and the system is constituted so that hydrogen gas can move. The balanced hydrogen pressure property of the hydrogen storing metal alloy (3) of a container (1-1) shall be lower than the balanced hydrogen pressure property of the hydrogen storing metal alloy (3) of a container (1-2), and it shall be hard to decompose it.
The exothermic reaction operation of this system is as follows.
Occlusion of the hydrogen is carried out to the low hydrogen storing metal alloy laminating filler of the balanced hydrogen pressure property of the introduction container (1-1), current is passed in a coil (2), it depends on electromagnetic-induction heating, endothermic reaction is caused, and hydrogen gas is emitted. This hydrogen gas flows into a container (1-2). At this time, the hydrogen in a container (1-2) causes exothermic reaction, and serves as hotter heat energy. These heat energy is collected with a proper cooling means.
Moreover, the endothermic-reaction operation of this system performed succeedingly is as follows.
If electromagnetic-induction heating of a container (1-1) is stopped and a hydrogen storing metal alloy laminating filler (3) is cooled to arbitrary temperature, two containers (1-1) (1-2) will become the same temperature. Then, hydrogen begins to dissociate from the hydrogen storing metal alloy laminating filler (3) of the container (1-2) which a balanced hydrogen pressure property is high and tends to disassemble, and hydrogen is absorbed for a balanced hydrogen pressure property by the hydrogen storing metal alloy laminating filler (3) of a low container (1-1). At this time, the temperature of the hydrogen storing metal alloy laminating filler (3) of a container (1-1) goes up, and the temperature of the hydrogen storing metal alloy laminating filler (3) of a container (1-2) falls.
It is the structure which hydrogen gas is made to come and go as mentioned above between the hydrogen storing metal alloy laminating filler (3) in two containers (1-1) (1-2), and (3), and carries out heating cooling using the heat of reaction. And when 2 sets always continues pouring hydrogen gas in the direction which carries out mutual, it is the container (1-1) (1-2) which can use heat of reaction effectively.
Below, it is incorporated by the view 2 in a container (1-1) (1-2), and the composition and an operation of the hydrogen storing metal alloy laminating filler (3) with which the very thing generates heat by electromagnetic induction are explained.
In a view 2, a laminating filler (3) is the layered product which carried out the laminating of the base material (4) to the primary member. A base material (4) fabricates the board, punching-like plate, or wire gauze which consists of a hydrogen storing metal alloy, and the example of illustration serves as a board.
Moreover, many holes (4-1) are processed into a base material (4), and crepe processing, embossing, and concavo-convex processing (view 7) are further given to the front rear face of a base material (4). Moreover, it is not monotonous and the base material (4) is fabricated by the mere wave (4-4) which has the degree of tilt angle (7) to a vertical axis (6). Moreover, the wave (4-4) of an adjoining base material (4) is piled up so that it may cross mutually, and the wave-like (4-4) intersection (8) is welded.
In addition, although a triangle, a square, and round any are sufficient as the cross-section configuration of the wave of a base material (4), it is a triangular thing in the example of illustration. In addition, although it is desirable to give various processings mentioned above at the front rear face of a base material (4), you may process nothing into a front rear face.
Furthermore, a monotonous base material (14) is inserted between base materials (4), these are mutually welded on the intersection (8) which the peak of the wave of a base material (4) touches also in this case, and it is made the structure object accumulated in the direction of a vertical axis at plurality. moreover, a monotonous base material (14) -- a base material (4) -- the same -- the front rear face -- a hole -- dawn processing, crepe processing, embossing, and concavo-convex processing are given
According to the hydrogen storing metal alloy laminating filler which was mentioned above, first, it is welded on the intersection (8), and a base material (4) and a monotonous base material (14) are possible at overall electromagnetic-induction heating, and

make uniform hydrogen desorption possible. Moreover, since it is a layered product, a surface area is large, and discharge and occlusion of hydrogen are uniformly performed by this. Furthermore, it is mixed while passing through the interior of a layered product, and the hydrogen emitted serves as a uniform style and is emitted.
A view 3 is a cross section showing the various configurations of an oscillation insulator column. This drawing (a) shows the thing (3-1) of a circle configuration cross section, this drawing (b) shows the thing (3-2) of an elliptical cross section, and this drawing (c) shows the thing (3-3) of a square configuration cross section. Incorporating the hydrogen storing metal alloy laminating filler of a view 2 can use the oscillation insulator column of other cross sections by doubling the configuration of a hydrogen storing metal alloy laminating filler, although the oscillation insulator column (3-1) of the circle configuration cross section of this drawing (a) is used.
A view 4 is a cross section when the oscillation insulator column (1) is the container which has a top plate (1-4) and a bottom plate (1-5). If it is made a container, the whole will become compact, and it will carry and be easy to carry out it.
A view 5 is a fragmentary sectional view showing the state where the coil (2) was laid under a part for the lateral portion of an oscillation insulator column (1). If a coil (2) is laid underground, a coil is not exposed, and while it is safe, it will become easy to deal with it.
A view 6 is a fragmentary sectional view showing the example of anchoring of the electromagnetic wave disclosure prevention board to the coil (2) by which the coil was carried out to the oscillation insulator column (1). This drawing (a) carries out the coil of the coil (2) to the outer wall section of an oscillation insulator column (1), and shows the state where the electromagnetic wave disclosure prevention board (5) is formed in the outside of a coil (2). A coil (2) is laid under a part for the lateral portion of an oscillation insulator column (1), and this drawing (b) shows the state where the electromagnetic wave disclosure prevention board (5) is formed in the outside for the aforementioned lateral portion.
A view 7 is a plan showing the example of concavo-convex processing over the base material (4) explained in the view 2. In the example of illustration, it is arranged so that a crevice (4-2) and heights (4-3) may become a grid-like intersection by turns. the hole of a base material (4) and a monotonous base material (14) mentioned above -- while there are distribution and a diffusion like dawn processing, crepe processing, and embossing to the liquid or fluid which passes a layered product, it contributes also to expansion of a surface area
An octavus view is drawing showing the state where the hydrogen storing metal alloy laminating filler (3) explained in the view 2 was accumulated in the direction of a vertical axis (6) in three steps. In the example of illustration, it is that from which the direction of a laminating of the base material of the hydrogen storing metal alloy laminating filler (3) of the middle and the hydrogen storing metal alloy laminating filler (3) of the vertical stage differed. If many directions of a laminating of the layered product of the stage are changed, as for a gas or a fluid, the flow of shaft orientations will become still more uniform.
A view 9 is a cross section of the container concerning the 1st example. A hydrogen input (12) is prepared in a top plate (1-4), and the inflow to the hydrogen storing metal alloy laminating filler (3) with which vapor-liquid was equalized in the upper part of an oscillation insulator column (1) is enabled by attaching a distributor (10) at the nose of cam of a hydrogen input (12). Moreover, the wall style prevention board (11) was formed between the hydrogen storing metal alloy laminating filler (3) and the insulator column (1), and the short pass which does not pass through a hydrogen storing metal alloy laminating filler (3) is prevented.
A view 10 is a cross section of the container concerning the 2nd example. A different portion from the 1st example is the point that the distributor (10) which enables the inflow to the hydrogen storing metal alloy laminating filler (3) with which vapor-liquid was equalized by the lower part of an oscillation insulator column (1) is formed.
A view 11 is a cross section of the container concerning the 3rd example. A different portion from the 1st example is the point that the ventilation machine (9) was formed in the upper part of an oscillation insulator column (1) instead of the distributor, and enables the inflow to the hydrogen storing metal alloy laminating filler (3) with which vapor-liquid was equalized like the distributor.
(Effect of a design)
Since the design of a claim 1 makes the hydrogen storing metal alloy itself generate heat by electromagnetic-induction heating and gives heat energy, it can heat immediately efficiently the whole hydrogen storing metal alloy which is carrying out occlusion of the hydrogen only by giving power, and can emit hydrogen quickly. That is, in the system of this design, thermal efficiency becomes good by leaps and bounds to heating progressing slowly from the heating surface by the conventional method depending on heat conduction. Moreover, since exoergic temperature is decided by electric energy to input, an elevated temperature is obtained comparatively simply, and although the hydrogen-absorption force is large, it can also use the hydrogen storing metal alloy which needs an elevated temperature for discharge. Moreover, the source of heating requires only connection of a power supply, and is easy also as a device.
Since the design of a claim 2 constitutes a hydrogen storing metal alloy from a layered product, the surface area becomes large, receipts and payments of hydrogen can be performed that much early, and much more heating effect is acquired.
A coil is not exposed, and the design of a claim 3 is safe and it handling-comes to be easy of a design.
An insulator column becomes some containers, and the whole becomes compact, and tends to carry and carry out the design of a claim 4.
The design of a claim 5 can prevent disclosure of the electromagnetic wave from a container which has the insulator column around which the coil was wound.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
A view 1 is drawing showing the hydrogen-absorption system of this design.
A view 2 is a partial cross-section perspective diagram of a hydrogen storing metal alloy laminating filler.
A view 3 is a cross section showing the various configurations of an oscillation insulator column.
A view 4 is a fragmentary sectional view of the oscillation insulator column constituted by the container.
A view 5 is a fragmentary sectional view showing the coil state of the coil to an oscillation insulator column.
A view 6 is a fragmentary sectional view showing how to form the electromagnetic wave disclosure prevention board to the coil of an oscillation insulator column.
A view 7 is the front view showing the example of concavo-convex processing to a base material.
An octavus view is a partial cross-section perspective diagram showing the state where the laminating filler was accumulated.
A view 9 is a cross section of the container concerning the 1st example.
A view 10 is a cross section of the container concerning the 2nd example.
A view 11 is a cross section of the container concerning the 3rd example.
(1) -- Oscillation insulator column
(1-1) -- Container
(1-2) -- Container
(1-3) -- Top plate of a container
(1-4) -- Bottom plate of a container
(2) -- Coil
(3) -- Laminating filler (layered product)
(3-1) -- Oscillation insulator column (circular)
(3-2) -- Oscillation insulator column (ellipse form)
(3-3) -- Oscillation insulator column (square)
(4) -- Base material
(4-1) -- Hole of a base material
(4-2) -- Crevice of a base material
(4-3) -- Heights of a base material
(4-4) -- Wave of a base material
(5) -- Electromagnetic wave disclosure prevention board
(6) -- Vertical axis of a base material
(7) -- The wave-like degree of tilt angle
(8) -- Intersection
(9) -- Blower
(10) -- Distributor
(11) -- Wall style prevention board
(12) -- Hydrogen input
(13) -- Hydrogen-desorption mouth
(14) -- Plate (base material)
(15) -- Switch
(16) -- Pipe

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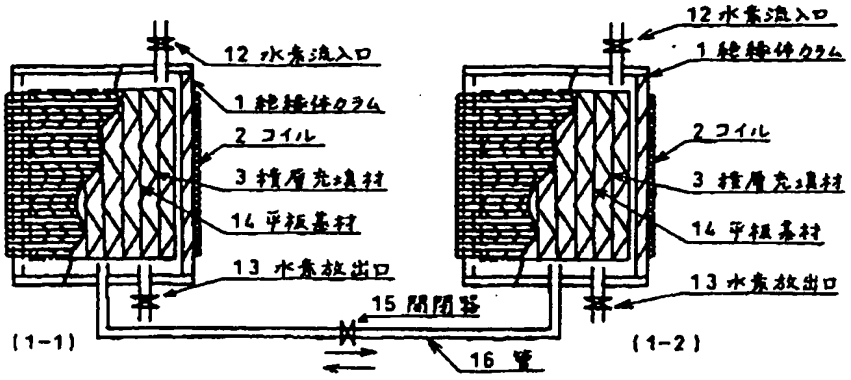
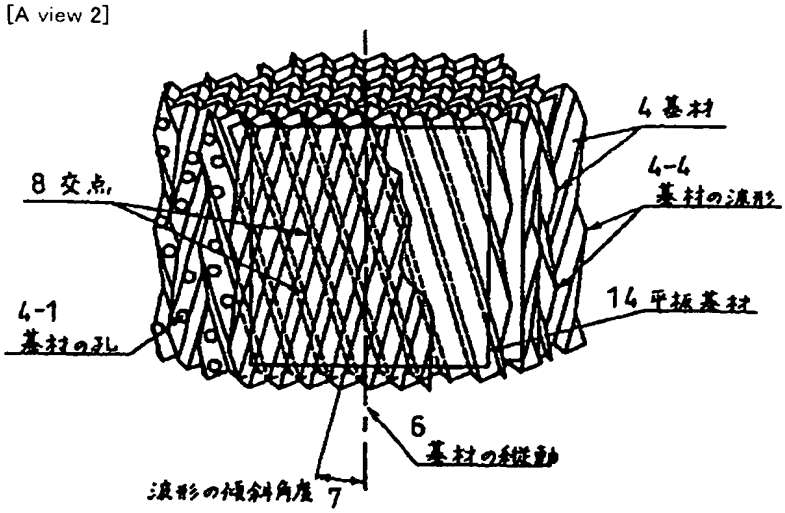
DRAWINGS

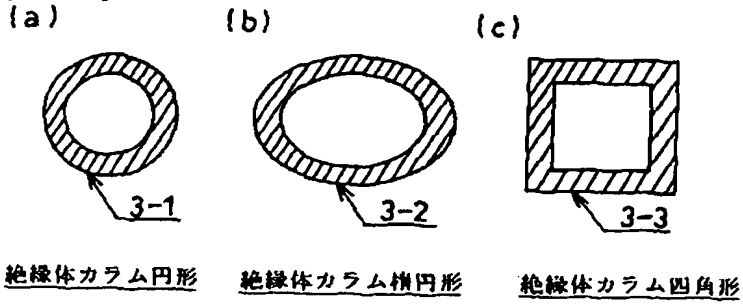
[A view 1]



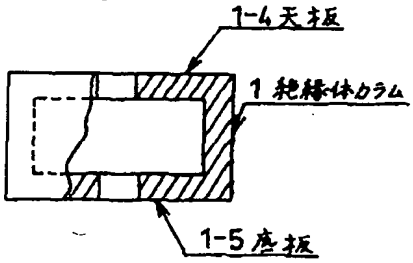
[A view 2]



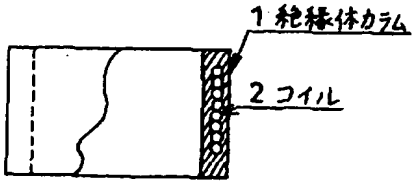
[A view 3]



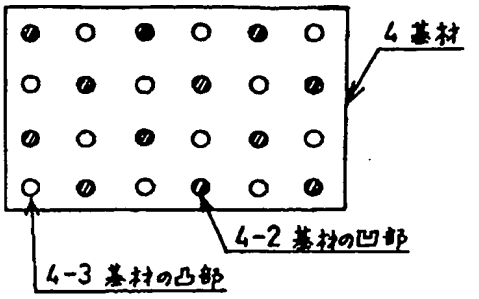
[A view 4]



[A view 5]

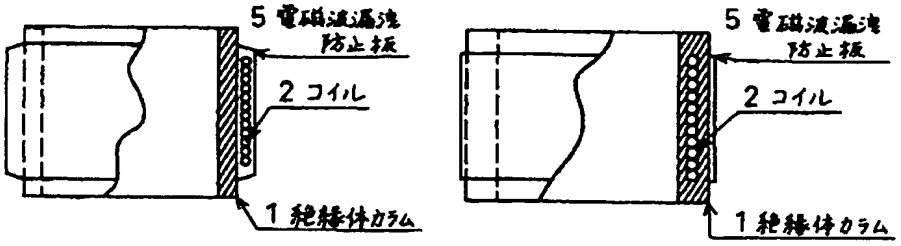


[A view 7]

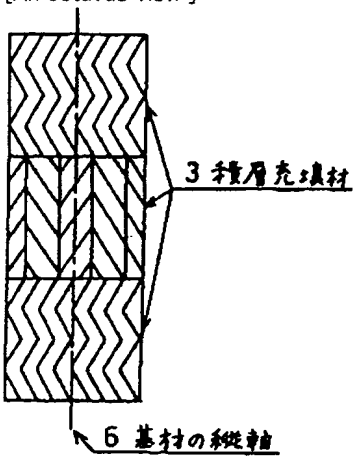


[A view 6]

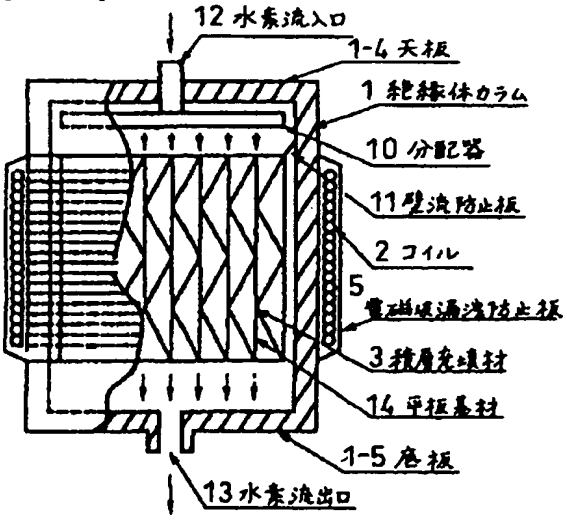
(a) (b)



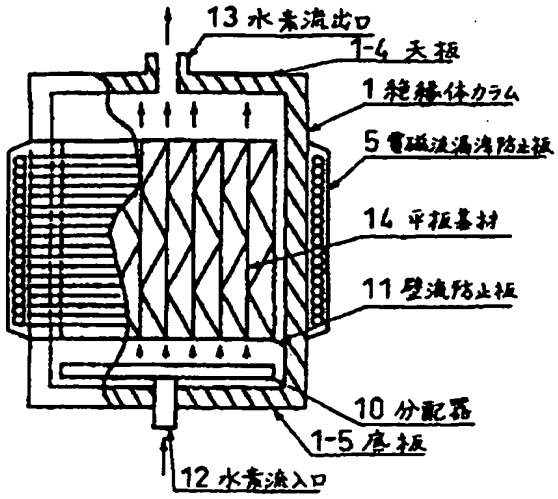
[An octavus view]



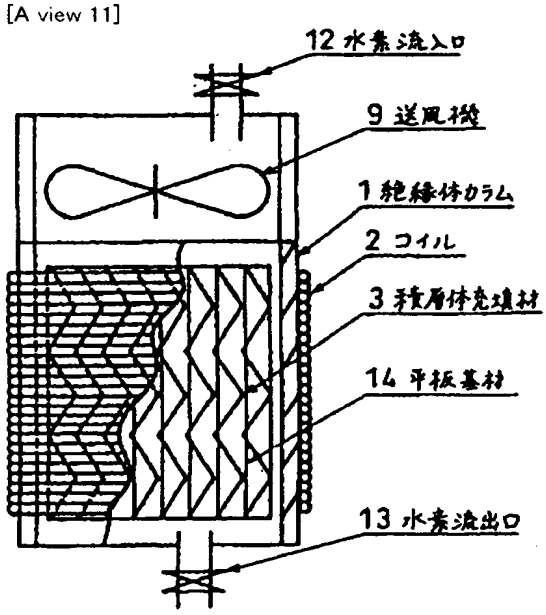
[A view 9]



[A view 10]



[A view 11]



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